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OFFICE OF FOREST EXPERIMENT STATIONS AND DENDROLOG

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OFFICE OF FOREST EXPERIMENT STATIONS AND DENDROLOGY

February and March, 1924

FOREST EXPERIMENT STATIONS

Washington

The meeting of the research men at the Forest Products Laboratory from March 10 to 22 gave an opportunity long denied the organization of getting together and thrashing out problems and troubles. About 40 men were in attendance representing both the Forest Experiment Stations and the Districts, while various members of the Laboratory attended the sessions intermittently. Col. Greeley, Mr. Carter, Mr. Kelley, and Mr. Chapline represented other branches than Research from Washington. Mr. Cox of the Weather Bureau at Chicago attended the fire meeting.

The program as originally prepared was not entirely followed, the discussions on fire taking up the first part of the meeting. This was followed by the requirement program and the growth and yield discussions. The last three days were devoted to a discussion of the station programs for the 1924 season.

The Laboratory entertained the visitors in a number of ways, the dinner of the Products Club and the trip through the Laboratory being the outstanding high lights. The trip through the Laboratory afforded a wonderful opportunity to a number of men, to whom the Laboratory has been only a name, to see the plant in operation and to see the wonderful organization developed by the Service. As a result, it will be possible for the Laboratory to use the stations more and for the stations to secure much needed help from the Laboratory.

The preparations for the meeting kept most of the men both in Washington and at the stations rather busy in the period preceding the meeting, so that there has been a lapse in the issuance of this monthly report.

District 5 has received some seed from Japan which some of the stations may desire to try out. If so they should write the District. The seed includes Chamaecyparis pisifera, Abies sachalinensis, Picea ajanensis, Larix leptolepis.

The Forester has approved the change in name of the Fort Valley Station to the Southwestern Forest Experiment Station. With this change passes the many associations which Fort Valley brings up, as this was the first

of the experiment stations established in 1907. The change in name indicates that the station can no longer be looked upon as a local affair, as it serves as a center for the investigative activities of the Southwest.

One of the outstanding accomplishments in the Section of Forest Measurements has been the completion of the bulk of the compilation necessary for the southern pine growth study. This study, originated some two years ago, has been partially financed by the National Research Council through a contribution from the Southern Pine Association and with assistance by State Foresters, forest schools, and interested people in the Southern States. The bulk of the work, as well as cost, has been borne by the Service. It is one of the biggest projects of its kind that the Forest Service has ever undertaken. The field work centered largely around the Southern Forest Experiment Station and much of the regular program of that station was set aside in order to push this work as rapidly as possible. Over 1,000 sample plots taken from Texas to Virginia in second-growth stands of the four important pines of the South are involved, and because of the difficulty of finding satisfactorily stocked stands in any one locality, it was necessary to make studies in practically every State in this region.

Since November the Section of Forest Measurements has been almost a unit in working upon this study and only incidental work was allowed to interfere in any way with its progress. This is the first time that work of this nature has been attempted in which the yields of several species have been expressed in the same way, all of them on the same basis of growth, and of the same degree and unit of utilization. Tables have been prepared showing the yields in cubic feet and cords both for merchantable and for total volume, and for peeled and unpeeled timber. Board foot volumes have, of course, been expressed according to the International and to the Doyle rules. The full report upon the growth and yields of the southern pine will not be made until some time later. The Southern Pine Association held a meeting in March at which the preliminary data was turned over to them for the use of their members.

In the early part of February the Forestry Advisory Committee of the Pulp and Paper Association assembled at the call of the Secretary of Agriculture to discuss the forest research problems relating to the pulp and paper industry. Besides the Laboratory and the Washington office, Directors Zon and Dana were in attendance. Both these men gave an outline of the work of their stations and the part that it would play in the solution of the troubles of the pulp and paper industry. As a result of the meeting a small committee was organized to act as an advisory council to each one of the two stations.

Dr. F. C. Craighead of the Bureau of Entomology early in February called a conference in his office on research work in forest entolomogy. Attending this meeting, besides members of the Office of Forest Insect Investigations, were Dr. Graham, of the University of Minnesota, who is working with the Lake States Experiment Station, Dr. Pierson, Forest

Entomologist at the Northeastern Station, and Dr. M. W. Blackman from Syracuse. Munns represented the Forest Service. The general plan of cooperation between forest insect investigations and the experiment station work was considered as well as a general outline of the plan of work in forest entomology. It was brought out that as rapidly as was made possible through the allotment of funds, men should be assigned to the forest experiment stations to work upon the regional problems. The need for greater training in forest entomology was recognized and recommendations made that a high standard of scholastic training and a thorough knowledge of basic sciences be required by men undertaking investigative work.

At the call of the Weather Bureau, Munns attended several meetings of a Department of Agriculture group to discuss the preparation of a paper for the 1923 yearbook on weather and agriculture. The Forest Service has been assigned the task of preparing a short article on forests to fit into the general paper which is to cover all phases of agriculture.

During March the compilation of the volume tables for the important tree species of the United States was completed. Three handbooks have been prepared, one dealing with the western species and two with the eastern, one on the hardwoods and the other on the conifers. It is planned to make these handbooks the same size as the ranger notebook, so that they can be used readily in the field. There are over 100 in each volume.

THE EDITOR'S OFFICE

What is an Acceptable Outline?

The answer to this question is difficult to formulate as the answer to the question: "What can I do to be saved?" In both cases the inquirer is apt to get a stereotyped or dogmatical answer that leaves him as much in the gloom as ever.

An acceptable outline might be described as a vivid sketch. The word "vivid" is underlined because it is important. A skeleton essay that is merely so many bones wired together is not the acceptable variety of outline. A sketch of a proposed dissertation that is not in itself vivid, living, will simply not be the structure of a vivid, living bulletin. Rough sketches made by great artists are preserved and admired because, however incomplete in detail they may be, they are alive in every curve and line.

Perhaps skeleton is a better analogy than sketch, for an outline should certainly be vertebrate. It should have one coordinating thread, or, more simply, it should be about one thing. That one thing may be the sum of many details, or it may be one detail of a far greater subject, but in itself unity it must have. What cannot reasonably be coordinated under that one main idea and cannot be correlated with the component parts of that idea, belongs in some other outline and article. One advantage of the outline often is that it reveals the author's unwitting effort to put forth a Siamese-twin or a three-headed calf as a unified idea. Some simple rhetorical surgery at this point can save a good deal of misery later on.

There is no law of sequence or scope for an outline. There is no set number of points that must be covered and no set order in which these should be presented. There is no such thing as a model outline, any more than there is a model human being. The model is the lucid and living presentation of a unified idea in the manner best adapted to edify the reader. The rest is up to the author's ability to think lucidly, vividly, and in terms of unity and coherence; together with his sympathetic respect for his reader's needs and mental equipment.

Generally speaking, an outline should indicate the answers to certain questions, such as -

"What is this about?"
"How does it relate to other work on this subject?"
"How far does it go on the lines indicated?"
"What original work does it have to offer?"
"What do these findings go to prove?"
"What fundamental principles underlie the work?
"Is the work conclusive, and, if not, whither does it lead?"

The next step, once the first draft of an outline is prepared, is to locate an inveterate pessimist, if possible on an off day, and let him ride rough-shod over the outline. In other words, send it in for the editor to look over.

Errors and Checking

Author, reviewer, and editor have a common interest in eliminating errors from manuscripts, and it surely demands eternal vigilance on the part of all to detect these in time. Where figures are used frequently errors have a way of creeping in "all unbeknownst." We believe that the publications of the forest experiment stations are of as a high standard as any other organization in the department, and higher than the most, and the careful work at the stations by all concerned is directly responsible for this, not least in eliminating mistakes. To maintain this standard the vulnerable spots in the preparation of manuscripts must be carefully watched. The author, after all, has the best opportunity to protect his writings from errors, for he is the most familiar with the work and the data involved.

Occasionally, as when text and tables in a manuscript do not agree, it is probably due in most cases to the fact that the tables were prepared in advance, and, in going back to the data for figures used in the course of text preparation, the author has not thought to make sure that there is complete agreement between the two. This is especially liable to happen where generalized figures are used in the text instead of the actual ones as given in the table.

Then there are sometimes errors that can be explained only as mental aberrations in the preparation, rewriting, and revising of the text. These sometimes remain unrecognized for years even after several painstaking revisions. They are the sort, too, over which the reviewer and editor are

most apt to glide unsuspectingly. An example is as follows (taken from a paper at hand and rooted out after numerous rereadings): "The area of the forest is 300,000 acres; 125,000 acres are in old growth, 25,000 have been cut over, 20,000 are unsuited to timber, and the remainder of the area, or 117,000 acres, has been converted to brush through fire." What became of the other 13,000 acres we don't know. Perhaps they've been sold.

Such errors do not detract, of course, from the value of the manuscript, but "the evil that men do lives after them," and Marc's remark is just as true of Forest Service publications. The unfavorable impression upon the reader that such blunders might cause makes it truly worth all our time and care to prevent. Our standard of accuracy in publications is fully as high as our standing in quality of subject matter, and we should keep it so.

DENDROLOGY

Work on Common Names of Trees

The Common Names Committee resumed its work in January and since then it has been holding almost daily meetings with the hope shortly of finishing its review of the common names of trees to be used in the revised Check List.

A Possible New Station for Apache Pine

Up to the present time the Apache Pine (*Pinus apacheca*) has been known only from the mountains of southeastern Arizona, southwestern New Mexico and of northern Mexico. Recently, however, a report from the Carson National Forest of an extraordinarily large-coned "western yellow pine" indicates that the Apache Pine has a small foothold also in north-central New Mexico. Mature cones and foliage specimens, just received from the Carson Forest, through Mr. Walter J. Perry, lumberman of District 3, shows that the Carson tree is probably a northern representative of *Pinus apacheca*, the most characteristic form of which occurs in southwestern New Mexico, southeastern Arizona, and in Chihuahua, Mexico. Here it is very distinct in general appearance from *Pinus ponderosa*. Leaves of *Pinus apacheca*, as represented in Arizona, New Mexico and Mexico, are from 8 to 15 inches long and much stouter than those of the Rocky Mountain forms of *P. ponderosa*. Cones and leaves of the Carson tree are quite well within the size of the southern forms of *P. apacheca*. One striking characteristic of these forms of Apache Pine is the practically unbranched habit that 3 to 6-year-old plants have, the only other of our native pines having this habit being *Pinus palustris*. It will be interesting to learn whether this early habit is shown by seedlings of the Carson tree, if any are to be found.

Range Maps for the Northeastern Station

Fourteen maps, for all of the conifers that occur within the Northeastern Forest Experiment Station's territory, have been completed and will be forwarded to the Station at an early date. Maps for other important groups which are being prepared will be sent to the Station as soon as they are completed.

APPALACHIAN

General

The winter meeting of the Southern Appalachian Section, Society of American Foresters, held at Asheville February 2, occasioned visits to the station by Dr. Haven Metcalf, Dr. F. C. Craighead, Professor G. A. Garratt, and others. The opportunity was used to discuss plans for cooperation with the Offices of Forest Pathology and Forest Entomology, and with the University of the South at Sewanee. As a consequence, cooperative work in forest insect studies has already been started, and an understanding was reached as to participation of forest pathologists and entomologists in several of the current projects. Under Haasis' guidance, Drs. Metcalf and Craighead visited the Biltmore plantations. In the Long Ridge plantations Dr. Craighead found evidences of the work of both Ips and Dendroctonus, and it was noted that while the present insect control measures practiced by the estate are effective in getting the dead trees out of sight from the main roads they are not adequate to check the spread of the bark beetles.

The preparation of abstracts for the Madison conference, work on current projects, and the writing of miscellaneous papers occupied the greater part of the time of the staff in February. The employment of temporary assistant L. H. Reineke has made it possible to practically complete computations of data for the yellow poplar and southern white cedar projects. The Biltmore plantations report is being shaped for publication after some additional field work, a few days more of which remain to be done.

Chestnut Blight

The program of the Section meeting of the Society of American Foresters was devoted to papers on the chestnut blight. The following papers were read:

"Chestnut Wood in the Tanning Industry," by Robert W. Griffith, of the Champion Fibre Company.

"Progress of the chestnut blight in the Southern Appalachian Forests," by G. F. Gravatt (read by Dr. Metcalf in Mr. Gravatt's absence).

"The position of chestnut in the timber sale policy of the Pisgah National Forest," by M. A. Mattoon, Forest Examiner, Pisgah National Forest.

"Some silvicultural aspects of the chestnut blight situation," by E. H. Frothingham.

The papers were of particular interest to members of the Appalachian Station in view of the proposed study of chestnut blight problems for the current year. The discussion, particularly the remarks of Drs. Metcalf and Craighead, brought out interesting points of view as to the spread of the blight and the possibility of checking it. Complete control was regarded as very unlikely even if the most strenuous attempts were made; although Dr. Metcalf expressed the belief that had the Pennsylvania campaign been continued a year or two longer the spread of the blight might have been stopped. That the spread was much more rapid from north to south than from east to west was indicated by a map exhibited by Dr. Metcalf which showed the present status of the blight in the Southern Appalachian region. Isolation of parallel ranges by rather broad valleys was held responsible. Among the resolutions adopted by the Section was one emphasizing the need for immediate investigation of the chestnut blight situation to determine the effect of the chestnut blight situation to determine the effect of the loss of chestnut on the composition of the forest, the measures likely to delay the disease, and means of preserving the supply of chestnut wood as long as possible.

Forest Types

The forest type committee of the Section presented a report of progress and was continued for the ensuing year. The report outlined principles upon which the classification will be made, and a basis of procedure to be followed in collecting suggestions from Section members and others. A final report will be made by the committee at the next annual meeting of the Section. It is obvious that a complete and workable forest type classification is indispensable for the best work of the Station. While it is hardly likely that a perfectly satisfactory classification can be devised at this stage, it is certain that the present general classification can be considerably improved.

Meetings

The annual meeting of the North Carolina Forestry Association at Washington, N. C., February 20, was attended by Frothingham, who read a paper on "Forest research: the basis for sound development of North Carolina's forest industries."

Frothingham also attended the dedication of Sage Hall, the new home of the Yale School of Forestry at New Haven. The ceremonies, which were held on February 23, were well attended, many Yale alumni returning for the occasion. After the dedication exercises, which were participated in by President Angell, Dean Graves, Mr. Sage (the donor's son), and the architect of the building, the program of addresses was given. Papers were read on "State Forestry," by R. S. Maddox; "Forestry Education," by J. A. Ferguson; and "Forest Research," by Frothingham; and a talk on "A Forester's Training as Preparation for Work in Other Fields" was given

by F. A. Silcox. The new building, in which comfort and attractiveness are well combined with utility and economy of space, marks a notable advance in facilities. According to Dr. Toumey, "Sage Hall has no basement nor attic"; every bit of space is utilized.

MrCarthy attended the supervisors' conference at Natural Bridge, Virginia, during the week of February 11. He reported a very interesting meeting, during which the problems confronting the administrative organization of District 7 were discussed. Questions of valuation of young growth and estimate of fire damage as treated in acquisition work were of interest to the Experiment Station. There was general agreement that the volume tables in use in acquisition work were unsatisfactory and that their revision should be undertaken, possibly by the Branch of Research. The discussion of management plans developed the need of further work to make them meet the present needs of the forests and to fit them for application by the field force.

During the conference McCarthy visited a pole treating plant where chestnut poles purchased from the Natural Bridge National Forest are being butt treated with creosote by the open tank process. He also spent a half day in the Arnold Valley section of the Natural Bridge National Forest where chestnut is seriously infected with blight, and bark beetles are doing considerable damage to hard pine and have subsequently attacked white pine. White pine weevil was also active on the reproduction.

Some locust which has been affected by leaf miner is now being cut on the Natural Bridge National Forest and it shows a serious repression of growth during the years it was infected. While there have been few trees killed, instances of killing are reported. The leaf miner attack, which is general through the Appalachian region, may be more serious than heretofore considered.

That part of March which was not absorbed by the Madison conference itself and the work preliminary thereto was taken up largely with the work on three department bulletins which the members of the staff are preparing. McCarthy's outline for the yellow poplar bulletin has been approved. Korstian has continued the work on the white cedar bulletin and is now awaiting a set of computations from Washington. Haasis has again finished the field work for the bulletin, "Forest Plantations at Biltmore, N. C.," and is pushing the revision and expansion of the manuscript. In addition the annual program of the station was prepared and submitted.

At the request of Dr. Craighead, of the Bureau of Entomology, a study of the time of insect infestation is being made near Asheville. McCarthy assisted Ranger Fink of the Pisgah National Forest in preparing the first set of trap trees on March 1 in the Bent Creek section. Similar sets of trees will be prepared at two-week intervals until June 1, when Dr. Craighead plans to examine the trees and select material from them for further breeding in cages. This is the first work undertaken by Dr. Craighead in this region, and we expect it will develop into more specific cooperation with the Bureau of Entomology in the study of local insect problems.

Korstian has prepared a preliminary working plan for the study of chestnut replacement problems. It is anticipated that this project will be carried on cooperatively with the Northeastern Station, State Foresters, Forest Schools, and other agencies.

McCarthy wrote an article on the "Forests of Northern Georgia" for the student publication of the Georgia Forestry School.

FORT VALLEY

Both Pearson and Krauch attended the Madison conference. The latter went from Madison to Washington to revise his proposed bulletin on increment of cut-over areas. He was delayed several days in Chicago by an attack of grippe. Krauch is scheduled to return to District 3 about May 1.

Pearson on his return trip from Madison stopped at Lincoln, Halsey, and Denver. In Lincoln he gave two talks before botany and forestry students of the University of Nebraska - one on the need and objects of forestry and one on forest research. A very full day was spent in the nursery and plantations at Halsey. Needless to say, the transformation since 1905, when he as a student took part in the planting, is almost beyond belief. Notwithstanding the high costs, and difficulties with tip moth and Peridermium, the fact that the Forest Service is converting these waste lands into a forest stands out as a notable achievement. In the Denver office he found occasion to discuss his old hobby, reproduction of western yellow pine with special reference to damage by grazing, which is now attracting serious attention in District 2.

From a meteorological point of view it is interesting to note that Fort Valley has more snow than any other point visited on the entire journey to Madison. The precipitation during the last half of March totaled 2.92 inches.

FREMONT

If the Director has been somewhat lax during most of the past year in "preaching forestry" to the public, it has been because suitable opportunities were not presented. On February 16 he was invited by the Rock Island Railroad to join a party of agriculturists which was to tour the eastern Colorado line of this railroad, beginning on the 18th, to talk many aspects of better farming with the dry-land farmers of that section. The Director did not feel that time was available for a 10-day jaunt of this character, nor that the fiscal status of the station would permit it. Attempt was therefore made to "pass the buck" to Mr. Johnson of the District office, who found himself even harder pressed for time, and then to the State Forester at Ft. Collins, who also declined. Since the Colorado Springs Chamber of Commerce has been for some time extremely interested in tree planting and was willing to pay expenses in

order to have the gospel spread, the invitation was finally accepted and Bates joined the party at Stratton, Colorado, on the 19th. In all 9 stops were made in the towns between Stratton and Calhan, 3 meetings per day were held, and at one meeting each day a tree-planting talk was given, reaching in the aggregate about 1,600 farmers and school children. The trip was decidedly worth while to Bates in giving him new, first-hand information on the possibilities of tree planting in this driest section of the Great Plains. It seems that these possibilities are limited only by the desire of the farmer for trees and his willingness to prepare and cultivate the ground as is necessary for any successful crop raising.

When Bates came to Colorado the year after making his study of windbreaks in Nebraska and Kansas, he felt that he was leaving the plains tree planting behind. With the advance of dry-land agriculture the problem has moved to his back-door and is begging for attention. It can no longer be neglected, and for this reason in a separate memorandum a new project is being suggested which will cover all such activities. One of the crying needs of eastern Colorado is for trees at the splendid new schoolhouses which have been built in many of the consolidated districts. As a result of Bates' trip it is believed the Colorado Springs Chamber of Commerce will sponsor a tree-planting contest between all of the schools, which will give a decided impetus to tree planting in general.

Another activity along public educational lines has been preparation for Forest Protection Week. The Director and the Supervisor of the Pike Forest have been working in close harmony in laying plans for publicity in the Pikes Peak region. It has been decided that the most thorough and effective way to get forestry into the schools at that time is by means of a leaflet which will discuss forestry both broadly and from the special standpoint of this region. This will be put up in attractive form and the Rotary Club of Colorado Springs has voted funds up to $100 for its printing. The leaflet will show that the rotary club is sponsoring the movement.

During odd times in February Bates has been working on papers for the Madison conference on his soil data and the final strokes for the lodgepole pine seed bulletin, which was mailed to the Forester on the 19th. May Heaven be praised! What we consider a good piece of local newspaper publicity on this job was obtained somewhat earlier and is attached.

Roeser has been largely engaged in working up management and mensuration data and has prepared for publication in the Journal of Forestry an article on Douglas fir cutting methods (Mc-4) which, it is believed, will be of rather broad interest. A number of other small compilation jobs have also received attention.

Ranger Robertson returned to duty February 11, and at present we are in the fortunate position of having two rangers at the station, which should mean a big jump ahead in the fuel and maintenance work.

Roeser has spent the larger part of March checking records and computing growth for the permanent sample plots in lodgepole pine. As a result of one of these computations it is found that the net annual cubic foot increment of a fully-stocked acre of lodgepole pine saplings (about 30 years old in 1909) is 78 cubic feet, including bark. The thinned stands in this group have not responded quickly and are producing much less wood. The "fully-stocked" stand contained 9,100 trees per acre in 1909, and in 10 years lost 680 trees per acre or 7.5 per cent. These plots come up for the 15-year remeasurement in 1924.

At the station considerable progress has been made on the fuel supply by Robertson, and Gibbs, in addition to the routine observations and greenhouse work, has made some progress on painting and other improvement work.

On account of the Madison meeting Bates has had little time for new work. At the end of the month a working plan was prepared for the growth studies, which will be carried on by means of increment borings on about 12 Forests.

At the close of the Madison meetings, Bates returned by way of St. Paul, where he visited the Lake States Station for 2 days and had a remarkable opportunity to become acquainted with the University men doing work along the lines of soils study, plant physiology, breeding, etc. This contact was extremely profitable as a means of checking up the direction of our more fundamental studies.

The first half of April will be used largely on the management studies and growth data, after which both Roeser and Bates will take up the spring activities at the station. These consist of field plantings in the source-of-seed experiment for yellow pine, nursery work with the other species, and greenhouse sowings for the study of transpiration and heat resistance, after which there is, as usual, an unlimited amount of soil analyzing. Field work on the Forests will probably not be undertaken before May.

LAKE STATES

The record of results for the month of February is as follows:

1. Completion of jack pine yield table (in cords and cubic feet) for lower Michigan.

2. Presentation of a statement on "What the Lake States Forest Experiment Station Can Do for the Pulp and Paper Industry" before the Advisory Committee of the Pulp and Paper Industry in Washington.

3. Completion of the report on the "Public Requirements for the Lake States."

4. Completion of the personnel of the Advisory Committee to the Experiment Station.

5. Report on "Forest Problems of the Lake States Region" (100 pages) prepared for submission to the Advisory Committee.

6. Abstracts of subjects (5) for discussion at Madison Conference prepared.

7. A plan prepared for filing miscellaneous and scientific pamphlets in the library and a large part of the actual work of arrangement of pamphlets completed.

8. Addresses during February:

Feb. 7 - Advisory Committee of the Pulp and Paper Industry, Washington, D. C.
Feb.15 - New York Forestry Club, New York, N. Y.
Feb.18 - Forest School of the University of Michigan, Ann Arbor, Mich.
Feb.21 - Mississippi Valley Lumber Salesmen's Association, Minneapolis, Minn.

The work of the station during March may be characterized by further progress in the preparation of the plans for the coming field season.

A great deal of the time of most of the members of the staff was spent away from the headquarters. Zon attended the Washington conference of the Advisory Committee to the Pulp and Paper Industry, the Minnesota Rangers Meeting at Duluth on March 5, and later the two-week conference of research men at Madison. Kittredge and Mitchell also attended the Madison conference for its entire duration.

The work proceeded in the preparation of plans for the jack pine study in Wisconsin and Minnesota, a tentative working plan for the study of reforestation results in the Lake States, and plans for fire protection studies.

Addresses during March:

Laymen's Association of the Unitarian Church, Minneapolis, March 1.
Minnesota Rangers Meeting at Duluth March 5.
Minnesota Section of the Society of American Foresters March 6.
Biological Society, Minneapolis, March 9.

CLOQUET (University of Minnesota)

1. Completion of yield study of jack pine on the rock outcrop in northern Minnesota (mixed stands of jack pine, aspen, spruce and white birch).

2. Computation of volume tables (in cubic and board feet) for white spruce.

3. Cost keeping system, similar to that of the U. S. Forest Service, worked out in cooperation with Mr. Zimmerli of the Washington office for the Cloquet station.

Completion of volume tables in cubic and board feet for white spruce in northern Minnesota.

The annual report for the Cloquet Experiment Station, together with plans for future work was prepared.

A memorandum was prepared regarding the purchase of seven additional forties to round out the boundaries of the Cloquet Forest.

A memorandum was prepared regarding the policy of maintaining a forest nursery by the State at Cloquet.

NORTHEASTERN

A number of meetings and conventions were held during February which were attended by members of the station staff. Of first importance was the meeting of the Advisory Committee of the Pulp and Paper Industry at Washington on February 7. At this meeting Mr. Dana presented a statement of projects which the station plans to undertake, the solution of which will materially aid the paper pulp industry. En route to Washington Dana attended and addressed the New York section meeting of the Society of American Foresters.

Firewarden fire conferences were held in various parts of Massachusetts during the month of February. Messrs. Meyer, Behre, and Westveld were in attendance at various meetings, getting in touch with the fire problems of the region.

The eastern states blister rust conference was held in Boston on the 18th and 19th of February. Dana, Westveld, and Meyer of the station were in attendance, while Behre was taking in the Extension Directors' meeting held in Springfield, Mass., on the 19th.

Dana and Westveld also attended the New England Association of Wood Turners' meeting held in Boston on the 19th. The association exhibited a keen interest in the forest problems of the region and the work being done and planned by the Northeastern Forest Experiment Station. The conservation of wood supplies was discussed and the importance of forestry recognized. The association showed how closer utilization on their part and better standardization of lengths and grades were effecting a great saving in waste. They expressed themselves as desirous of cooperating with the station in every way possible.

The entire station staff was in attendance at the New England Section meeting of the Society of American Foresters held in Boston on the 20th. The program was devoted to forest research now under way and problems most in need of investigation in the various regions of the New England States.

Mr. Dana was also in attendance at the meeting of the Association of Northeastern Agricultural Experiment Station Directors held in Boston at the close of the month.

While Dana was in Washington he took up many matters of direct interest to the station. Plans were made for cooperation between the station and the bureaus of Entomology and Pathology which will undoubtedly result in stimulated activity in the fields of entomology and pathology.

Behre spent two weeks at the Yale Forest School working with Merrill checking the figures Merrill secured on hemlock to determine the applicability of applying universal taper tables based on a mathematical formula. He also had an opportunity to check the formula against red pine figures secured by Harvard. Westveld and Meyer are still working up the data they secured last fall on the spruce growth and yield study. The effect of the spruce bud worm on these stands has tended to complicate the problem. The taking of numerous borings and the tallying of trees killed has facilitated the solution of the problem of the amount of damage done by the budworm. Westveld is supplementing his spruce and fir reproduction study with greenhouse experiments.

During the month Mr. Dana gave addresses at the following meetings: Mylta Club (New York Lumber Trade Association, New York City); New York Foresters' Club; Eastern States Blister Rust Conference, Boston; New England Association of Wood Turners, and Association of Northeastern Agricultural Experiment Station Directors. On February 12 Westveld gave an address before the Hudson (Mass.) Rotary Club.

March was largely occupied with the Madison Conference and preparations for the meeting of the Northeastern Forest Research Council early in April. The former was attended by Dana and Behre, both of whom had papers to prepare. The conference was an exceptionally successful one, and proved most instructive and stimulating to those who were fortunate enough to be present. One unfortunate result was the transfer to this station of the responsibility for putting the public requirements report for the Northeast into final shape. Behre had to go west on personal business immediately after the conference, and was absent on leave without pay the rest of the month.

The following men accepted Secretary Wallace's invitation to become members of the Northeastern Forest Research Council:

W. R. Brown, President, New Hampshire Timberland Owners' Association; Chairman, New Hampshire Forestry Commission, Berlin, N. H.

P. S. Collier, Secretary, Northeastern Retail Lumber Dealers' Association, Rochester, N. Y.

S. T. Dana, Director, Northeastern Forest Experiment Station, Amherst, Mass.

R. T. Fisher, Director, Harvard Forest, Petersham, Mass.

J. H. Foster, State Forester, Concord, N. H.

R. S. Hosmer, Dept. of Forestry, N. Y. State College of Agriculture, Ithaca, N. Y.

C. H. Keith, President, New England Box Co., Greenfield, Mass.

R. S. Kellogg, Secretary, News Print Service Bureau, New York, N. Y.

J. C. Kendall, Director, N. H. Agricultural Experiment Station and Extension Service, Durham, N. H.

Franklin Moon, Dean, N. Y. State College of Forestry, Syracuse, N. Y.

H. G. Philbrook, President, Vermont Timberland Owners' Association, Boston, Mass.

G. W. Sisson, Jr., President, Racquette River Paper Co., Potsdam, N. Y.

W. L. Slate, Jr., Director, Conn. Agricultural Experiment Station, New Haven, Conn.

J. W. Toumey, Professor of Silviculture, Yale School of Forestry, New Haven, Conn.

F. A. Waugh, Head, Division of Horticulture, Mass. Agricultural College, Amherst, Mass.

The two prospective Maine members, one a representative of the pulp industry and the other of the wood turning industries, declined the Secretary's invitation too late to invite anyone else prior to the first meeting of the council. With this exception, the council is thoroughly representative both of different parts of the region and of the agencies particularly interested in forest research. It is a strong body and should be effective not only in advising the station but in stimulating forest research by other agencies throughout the Northeast.

Westveld spent a considerable part of the month compiling and revising available information as to projects already under way in the region and suggestions for any projects. This preliminary review of the situation indicates that there are more than fifty agencies engaged in forest investigations, and that these have under way in the neighborhood of two hundred projects. The majority of these are in forest management, with forest protection, forest mensuration, and forestation next in order. Most of the work is being done by responsible agencies, such as forest schools, state departments of forestry, agricultural colleges and experiment stations, botanical gardens, and pulp companies.

During the month Westveld and Meyer spent considerable time going over all available forest literature relating to the Northeast. Very brief abstracts of most of the publications were made for the files and for future reference. A systematic attempt is being made to locate, catalogue, and index all published and some manuscript material relating to the region. The amount of literature that has been unearthed is rather surprising.

Westveld also worked up some preliminary results of the spruce reproduction data which he obtained last fall. The most striking facts brought out by these are the very great increase in hardwood reproduction following clear cutting in the spruce type, the increased growth of advanced but formerly suppressed spruce and fir reproduction, and the amount of slash which covered approximately 30 per cent of the cut-over area. A few of the even-aged spruce sample plots taken by Meyer last fall showed a yield of approximately forty cords per acre at sixty years. Practically no difference was discernible between the yields on spruce flats and old pastures.

Meyer made a short trip to Melrose Highlands to confer with the Bureau of Entomology in regard to the sample plots connected with the study to determine the relation of forest management to gipsy moth control. The Bureau of Entomology apparently does not care to go further with these plots than to keep annual records of moth infestation and defoliation. Since no records of individual trees have been kept, it is doubtful how much use can be made of the plots from a strictly forest management point of view. A field examination of some of them will probably be made later in the spring, however, in order to obtain more definite information on this point.

PRIEST RIVER

During the last week of February a conference of technical men and lumbermen of the District was held in Missoula, which was attended by most of the members of the experiment station staff. Both Messrs. Wahlenberg and Kempff came to Missoula to be present at the conference. The program was devoted entirely to forest management subjects, including timber surveys, timber sale contracts, marking, scaling, slash disposal, etc. Considerable discussion was given to revised marking rules for the several types and committees were appointed to review the proposed rules. In this connection Larsen and Weidman acted as ex officio members of the white pine and yellow pine committees on marking rules. Incidentally this meeting of the technical men afforded the first occasion on which all the six men of the experiment station staff were together at one time.

During March, Weidman and Gisborne were away for the greater part of three weeks in attendance at the Madison conference. Weidman presented the public requirements for yellow pine in the Northwest and Gisborne various subjects in connection with fire studies. Messrs. Koch and Flint represented the District at the conference; the former presented western white pine public requirements and the latter fire studies from the standpoint of administration.

Most of February and early March were spent by Weidman in completing final reports on public requirements, desirable practice and devastated lands, for yellow pine in the Northwest. Gisborne spent much of this time in preparing material for his papers at Madison and in completing the compilation of the lightning storm observations made by the lookouts last summer.

During February Larsen spent the greater part of his time on the manuscript of the manual for silvicultural practice in District 1. This manuscript, which was started several years ago, is to include a brief silvical description of the various trees and types of the District, and a discussion of their silvicultural treatment, including instructions in marking and slash disposal for each type. The manuscript is now ready for review by the Office of Forest Management. It is hoped that this can be forwarded to the Forester some time this spring. During March Larsen put the finishing touches on about 12 short reports on early planting projects at the experiment station. Most of these are typed and will be ready for forwarding to Washington as soon as they can be gone over here.

Haig has been engaged continuously in the compilation of the white pine yield study. This work is now at the stage where the assembling of the data into tables can be begun. During the last month Larsen has also put in considerable time on the yield study, going over very carefully the data available from Rockwell's yield study of about 16 years ago. Much of the latter work was based on very small plots located in optimum stands, but it is believed that about 25 of the plots are of satisfactory size and normality to be used with the plots taken during the last two years.

Much of Wahlenberg's time in February was devoted to compilation of material in connection with the survival project and with projects on white pine and yellow pine age class tests. Reports are being prepared for these projects. As a member of the board of review appointed by the Branch, Wahlenberg spent some time reviewing the bulletin on lodgepole pine seed by Bates. A week was spent in Missoula at the time of the meeting of technical men.

At the experiment station, Kempff has been engaged in work connected with the two small timber sales in operation there, and in maintenance and improvement work around the station buildings. Kempff also spent a week in Missoula at the time of the meeting of the technical men of the District.

SOUTHERN (January and February)

General

The greater part of January and a portion of February were spent by Mr. Forbes as secretary of the Southern Forestry Congress, in getting everything in shape for the Sixth Congress, which was held on January 28, 29, and 30, at Savannah, Georgia. Messrs. Forbes, Hadley, and Wyman represented the station at this congress. We are very glad to be able to say that it was a big success. In view of the ever-increasing volume of work necessary to make this organization a permanent success, Mr. Forbes felt obliged to resign the secretaryship held by him for the past three years.

Mr. Hadley accompanied Mr. Wyman back to Starke, where he spent 10 days. Mr. Forbes also went to Starke, after winding up the affairs of the Southern Forestry Congress in Savannah, and spent about nine days there.

Much discussion took place which will prove very beneficial. Forbes and Hadley were able to render a good deal of assistance to Wyman in the form of labor on the fire and naval stores projects. Forbes visited Jacksonville and Pensacola on his return to New Orleans, spending one day in each.

During January Mr. Wyman made an address before the Legislative Council of the Florida Federation of Women's Clubs in Jacksonville, in which he described the work we are doing at Starke.

Mr. Wyman was requested to take the Boys' Forestry Club of the East Jacksonville School on a field trip to Jacksonville. Mr. A. A. Coult of the Florida Development Board and the teacher accompanied them on the trip.

During these two months we received splendid cooperation from the Bureau of Soils. Their Mr. A. C. Anderson spent from January 22 through February 29th making soil surveys of the "200 Acre Tract" at Bogalusa and the "Tate Lease" at McNeill. These surveys will be a great help to us in the future.

Mr. Hadley completed his "Annual Report of Work Accomplished at the Bogalusa substation during 1923." This article will be forwarded to Washington after Mr. Forbes has gone over it.

Considerable time during February was devoted by Mr. Forbes to the Investigative Program, which was completed, except for the project sheets, on the 19th.

On February 29th Mr. Forbes accompanied Messrs. Winslow and Hawley of the Forest Products Laboratory to the plant of the Braithwaite Paper Company, Braithwaite, La.

Mr. Hine spent from February 21st through the 29th to good advantage in the New Orleans office, working on and discussing with Mr. Forbes miscellaneous matters.

Miss Spuhler completed the card index on all books and bulletins in our library at the present time. This index will enable us to place our hands at once on all the material which we have on a given subject.

The Starke substation received a good deal of publicity in January by the Progressive Farmer and the Southern Lumber Journal.

Among the visitors to the station were the following: New Orleans Headquarters: Mr. E. I. Kotok of D-5; Mr. A. C. Anderson of the Bureau of Soils; and Mr. Gordon T. Backus, District Forest Inspector, Bogalusa-McNeill substation; Miss Freda Ditmers, Botanist and Dendrologist of Ohio State College; Mr. Austin Cary, Washington; and Miss Eloise Gerry, Mr. Carlile P. Winslow, and Mr. John D. Rue, all of the Forest Products Laboratory. Starke substation: Mr. A. A. Coult of the Florida Development Board, Jacksonville; Mr. E. R. McKee, Valparaiso, Florida; Mr. Austin Cary, Washington; Messrs. Carlile P. Winslow and John D. Rue, and Miss Eloise Gerry, all of the Forest Products Laboratory.

Protection

Fires.--Three days in January were spent by Wyman locating suitable places to establish fire studies in young slash timber and to run strips for an extensive fire and turpentine damage study. Two quarter-acre permanent sample plots were established in 14-year-old slash pine by Forbes, Hadley, and Wyman, and the first year's work on them completed during February. The plots are situated at Raiford on property belonging to the Florida State Farm. They were designed to determine the effect of annual winter fires on pole slash pines. Four .075 acre plots were laid out in 7-year-old slash pine saplings for the same purpose. These also were located at Raiford. Measurements were made, tagging, burning, and fire lines were finished.

Mr. Hadley prepared a "Report on Experimental Sowing of Carpet Grass on Steam-skidded Cut-over Land." It is awaiting Mr. Forbes' comments before transmittal to Washington.

The seedlings on the Roberts plots were counted in January by Mr. Hine for the first time just previous to the annual burning. Note was taken of the extent to which the seedlings were diseased, and individual tree records were started on about 200 seedlings in each of the two areas. The area of the burned portion was reduced to provide for a control strip and the seedlings within this strip were tallied separately. The burned area was fired for this year in February.

A working plan was prepared by Mr. Hine for the fire study in loblolly pine. He also drew up a working plan for the general fire studies to be made at the station. Both of these were submitted to Mr. Forbes for criticism.

Grazing.--Mr. Forbes spent several days of January at McNeill. During this time he and Mr. Hadley made a strip survey of the "Tate Lease," and completed the seedling count and location of quadrats. Some field and office work was done by Hadley on the quadrat maps. Agronomist Reed of the Coastal Plain Experiment Station took full notes of grasses on each quadrat. Rain prevented Mr. Hadley's getting very far on the survey of the new 10-acre check plots and quadrats on the "Tate Lease." Wire pins with metal tags were placed at location of stakes on quadrats on burned pasture. If stakes burn up these wire pins and metal tags will make it possible to re-establish all quadrats. Plot B of the Pf-112 series was burned during January. Fire lines were reconstructed before burning and complete notes of conditions before and after burning were made.

Management

A few minor revisions were made by Mr. Hine on his Mr-1, Urania, report. The plot maps were slightly revised and forwarded to Washington for drafting.

Mr. Hine reports that a number of the tags have been removed from trees in the "Maxwell Plots." In the "Holly Plots," located near town, every tag but one has disappeared. The painted numbers, however, are still clear.

Naval Stores

Mr. Wyman and Mr. E. R. McKee took some 15 men and women on an inspection trip of the Sampson Lake Tract on the 26th of January.

Mr. Wyman helped Mr. Cary to mark a thousand cups on his land. Some of these will be used as a basis for certain tests this year if approved.

Messrs. Forbes, Hadley, and Wyman worked up plans for new work at Sampson Lake. Some of these will take the place of old projects which will be abandoned.

About 16 days of February were spent by Wyman on naval stores work. The slash and longleaf tracts were burned over by him early in the month. Raking and burning of both tracts were completed.

Forestation

Mr. Hadley prepared two more sets of pine seed for germination tests, which will be undertaken by the Louisiana State University and the University of Georgia.

The January "Time of Sowing" seed was put in by Mr. Hadley at Bogalusa. He found upon examination that the previous sowings had suffered severely from frost heave.

Mr. Hine completed his report on the two plantations in the Greeley Pasture. He made a map of each of these plantations and forwarded them, together with the report, to Mr. Forbes for comment.

SOUTHERN (March)

General

For Forbes and Hine the Madison conference was the chief event of the month, occupying not only the actual time spent at Madison, but the greater part of the first ten days of the month as well, which were devoted to preparing our own presentations and reading the reports of others. The annual Investigative Program was briefly presented to the Madison conference and commented upon. Very little new work has been proposed over and above current projects. The report and program are now in the Branch for final action. A definite decision has been reached to designate New Orleans as Mr. Hine's headquarters, instead of some such point in the field as Alexandria or Monroe. No change is contemplated in the cases of Messrs. Wyman and Hadley at least for the present.

Miss Spuhler took advantage of the Director's absence to catch up on an accumulation of copying jobs and odds and ends, and made a start on assembling our photographs in more usable shape.

Hadley attended the annual meeting of the Southern Pine Assocation at New Orleans for the purpose of ballyhooing our newly-released growth figures on southern pine. Wyman was one of the speakers at the second annual meeting of the Florida Forestry Association at Jacksonville.

Hadley was called upon to review Dunning's article on "Some Results of Cutting in the Sierra Forests of California," and was also asked to criticize Mr. Bates' manuscript on "Collection, Extraction, and Germination of Lodgepole Seed," as a member of the Board of Review for the latter article.

Mr. A. C. Anderson of the Bureau of Soils spent the first seven days of the month on our "200 Acre Tract" at Bogalusa, which he reported to be for the most part first-class agricultural soil. He reached Urania on the eighth, and after a day's cursory examination of our 1,500 acres in company with Mr. Hine inclined to the opinion that the land was chiefly "forest soil." A lumberman from Mobile, Alabama, visiting Urania to learn about reforestation helped Hine to burn one of his plots and was much interested in our experimental work. We had several New Orleans visitors, but none on missions of particular interest. Hine and Forbes stopped off a day in Chicago in order to call on the editors of lumber journals and lumbermen interested in the South.

Protection

Fire.--Hine finally struck a day at Urania when his youngest age class of loblolly pine could be burned. These plots are in the Elk Pasture, and have not been burned in probably eight or nine years. A heavy rainfall only two days previous did not prevent the flames from mounting to a height of 25 feet in the crowns of the largest trees, and the damage will undoubtedly be greater than from a typical single fire in land annually or at least periodically burned.

Forbes and Hine on their way back from Madison visited the shortleaf fire plots on the Arkansas National Forest. To our disappointment most of these plots are of only doubtful value. One set in scattered reproduction of small seedlings hardly has enough seedlings to repay study, and a second series, although in timber of the size specified in the working plan, is in a stand of such age as not to be of great interest. That is, the timber is hurricane stuff about 80 years old, from which a few of the largest trees were removed in logging just prior to the establishment of the plots. Fire damage to stands of this age is not of great interest in the shortleaf belt as a whole, where growth is considerably better than on the Arkansas, and the cutting has introduced a variable the effect of which would be very hard to segregate from the effect of burning. By making a stump tally and a record of the distance of the stumps from the remaining trees we secured data which should enable the conversion of the study into a management project by the local forest officers. Under present conditions we are not warranted in spending any time of our own on it. The remaining two sets of plots are more

nearly what we wish, but the saplings in one set must be tagged before their growth can be satisfactorily observed, and the irregularity of stocking will interfere seriously with our drawing any certain conclusions from periodic growth. This tagging will not be done unless Hine finds it impossible to locate more satisfactory stands of shortleaf pine near Urania. The fourth set of plots, in small poles about 25 years old, contain two plots which we felt it worth while to retain, one for winter burning and the other as a check plot. Supervisor Plymale agrees with us that permanent sample plots are needed chiefly in the study of damage from winter fires, the effect of summer fires being easier to get at in wide areas which have burned over during the summer on a known date. The effect of the summer fires of 1922, both in the sapling and small pole sets of plots, were of course carefully observed by means of retallies.

Apparently no one took exception at Madison to our methods of studying fire damage. In fact, not a great deal of the Madison discussion of fire was of direct interest to us, although of great general interest.

Grazing.--Hadley made cooperative arrangements with Superintendent Greene of the Coastal Plain Experiment Station for some incidental work in connection with our grazing study there. This will consist of artificial sowing of carpet grass seed under several densities of reproduction, and the thinning of longleaf pine reproduction to determine the effect on the maintenance of forage values. We have found that the heavy leaf fall from dense stands of longleaf pine apparently considerably reduces forage values.

Measurements

Forbes presented at Madison summaries from our empirical study of loblolly pine which tended to show that several of the plots which had seemed to him and Hine to be decidedly open would have been classed as normal by some of the crews which collected the normal data, and raised the question whether under the circumstances we could get very far in the bulletin in projecting the idea of normal stands into the lay mind. Although he had about made up his mind that such an effort was a waste of time, and that it was hopeless to attempt the calculation of reducing factors whereby our normal yields might be applied to empirical stands, he was surprised to find the meeting in favor of a continuation of the work. Mr. Brown is now going over the data already gathered in a far more critical way than has heretofore been possible with the Southern Pine Association clamoring for publication of the yield tables. No further field work will be undertaken until this critical reexamination has been completed.

Hadley spent a couple of days checking his tupelo growth data and putting the tables in final shape. He submitted an outline for the proposed circular on the growth of second-growth tupelo.

Management

Minimum and public requirements for the South were resurrected at the Madison meeting, and probably owing to the absence of men acquainted with southern conditions, came through largely unscathed. Colonel Greeley's decision that the form of presentation in each region would be predicated on local conditions there is very grateful to us in the South. It apparently relieves us of the necessity of writing up a great deal of theory backed by few known facts, and reduces our report largely to one on minimum requirements for the pine type.

Naval Stores

The month has been a particularly busy one for Wyman, who raised the cups and did his first chipping in both our longleaf and slash stands at Starke. Cold and rainy weather unprecedented in 35 years of weather records caused the money which had been put in early chipping over two-thirds of the naval stores territory to be practically thrown away. Wyman put his first streak on the longleaf on the 18th, and on the slash a week later. Sampson Lake, which last year flooded a number of our virgin cups, broke all records by rising three feet and covering 200 cups which had been raised to a height of 20 inches.

In addition to getting under way on his chipping Wyman did considerable work scribing faces, renumbering trees, etc. He also completed his report on the establishment of the slash pine experiments, and made considerable progress on the report of the longleaf experiments.

Forestation

The complete wiping out of two slash pine plantations at McNeill by a fire in February or March was discovered by Mr. Hadley during the month. The plantation in question had necessarily been located outside of the main fenced area of the Coastal Plain Experiment Station, although on land belonging to the station. We knew when we put the plantations in that we were taking a chance on being able to protect them, but in default of any other site we were obliged to go ahead. The plots first had to withstand the unexpected ravages of goats until surrounded by a temporary fence. They recuperated only to fall victims to the fire, which was probably set by a neighboring farmer who felt that the six year "rough" surrounding the plantations was a menace to his fences. The planting sites were burned last spring prior to planting, and fire lines were ploughed. None of the officials of the Coastal Plain Station were aware that the fire had taken place until long after the burn. Fortunately, Hadley's fall count will give us a little information on the comparative value of the methods used in planting, although the comparison is for only one growing season.

Carrying out cooperative arrangements earlier made with the Great Southern Lumber Company, Hadley carefully supervised the sowing of more than 600 square feet of seedbeds in the company's nursery. The company supplied over 20 pounds of slash, loblolly, and longleaf pine seed. Variables included in these tests were density of sowing, chemical treatment for weeds and damping-off fungi, and types of soil cover or mulch. Sulphuric acid and zinc sulphate were the chemicals used and the soil covers or mulches were burlap, sphagnum moss, and pine needles. Strips three inches wide and four feet long were laid out for careful seedling counts in each broadcast bed containing 20 square feet.

The first report on germination tests made by cooperating agencies was received from the Mississippi Agricultural College. Some doubt is cast upon the value of these tests by the fact that Mr. Hadley found in more than one instance a higher germination per cent in his nursery beds than were indicated in the more supposedly careful germination test.

DISTRICT 5

The month of February was spent entirely in the office by both Show and Dunning. Both men spent considerable time in preparation for the Madison meeting. Aside from this, Dunning continued work on progress reports on a series of eight permanent methods of cutting plots, remeasured last fall. Show and Kotok continued on the weather and fire study.

R. W. Ayres, former Supervisor, and recently reinstated, was detailed to the office to assist in the Economic Study started some five years ago under Coert DuBois, but dropped for lack of qualified men. Ayres is busy completing the agricultural land map, which, according to the soil experts, is the most comprehensive in the United States. It attempts a "site classification" of agricultural lands, both those used and at present unused, as a basis for prediction of future agricultural population and hence need for wood. This is but one small phase of the entire undertaking.

The continued drought in California has led to many inquiries concerning the probable nature of the coming fire season, which has already a running start in southern California. So far we have managed to side step.

The most important event during March was, of course, the Madison meeting, which consumed the bulk of the month for both Show and Dunning. One event of some interest is to be recorded, however. During the early days of March Show completed for the Eldorado Forest the detailed analyses of fire statistics, including their relation to the administrative work. This finishes the work for all of the important forests in California, which have been covered in the past three years by Show and Kotok working together.

Work was continued on the Economic Study by R. W. Ayres. Great difficulty has been experienced in securing authentic information concerning the location and extent of potential agricultural lands in the foothill region. Efforts are still being made to secure reliable information and if such is not now available it seems probable that the California Development Association, a powerful organization, will cooperate with us in securing the needed information. During the month Ayres was able to assemble a good deal of information on important exports and production of lumber for the state. Preliminary figures indicate a surprisingly high per capita consumption of about 1,200 board feet per year. For the year 1923 the production of lumber in California was only about half of the consumption for the state, a rather surprising condition for a region so rich in forests as is this state.

The most important part of the Economic Study is an attempt to forecast the future needs of wood in the state and to determine the amount and distribution of agricultural and industrial population. We have been able to secure very detailed estimates along these lines made by the Pacific Telephone and Telegraph Company, and negotiations are under way to secure similar figures from some of the great power companies in the state. Such information as this will be invaluable in carrying ahead the project, and we have been assured that the Forest Service will be free to use any information of this sort which is available.

Ayres' work during the past month or so has been exceedingly valuable in the prosecution of this very important study and if present plans are followed he will be available for some little time to come.

The Minimum Requirements report for the California pine region is being distributed to important lumber operators, associations, etc., for their comment before the preparation of the final draft for publication.

LIBRARY

The Library loaned 844 books and periodicals, and 116 members of the Service and others consulted the library in person in February. There were 227 books and articles indexed for the catalogue.

During the month of March the library loaned 839 books and periodicals, and 138 members of the Service and others consulted the library in person. The total number of books and articles indexed last month was 216.

Manuscript News Notes

District 6

Tree Classification in Sweden. E. J. Hanzlik. (To Journal of Forestry.)

Appalachian

Some Aspects of the Chestnut Blight Situation. E. H. Frothingham. (Journal of Forestry.)

Sample Plot Computations. F. W. Haasis. (Journal of Forestry.)

Forest Research. E. H. Frothingham. (Paper read at dedication of Sage Hall, New Haven, February 23.)

Density of Cell Sap as Reflected in Environmental Conditions. C. F. Korstian. (To Journal Agricultural Research.)

Trail of the Vanishing Spruce. C. Jeffers and C. F. Korstian. (Revised-to American Forests and Forest Life.)

Growth of Western Yellow Pine in Virgin and Cut-Over Areas. C. F. Korstian. (to author for revision.)

Southern

Annual Investigative Report for 1924.

Some results of cutting. E. W. Hadley. (Rev. of Dept. Bul. 1176 to Ecology.)

Fremont

Characteristics of Lodgepole Pine Seed. C. G. Bates. (Board of Review.)

A Study of Douglas Fir Reproduction with Various Cutting Methods. J. Roeser. (Journal of Forestry.)

Washington

Handbook of Volume Tables for American Tree Species: I. Western Species; II. Eastern Conifers; III. Eastern Hardwoods. E. N. Munns and R. M. Brown. (Department publication.)

District 5

Role of Fire in Pine Forests of California. S. B. Show. (Department Bulletin:- Final editing- to Department.)

Lake States

Mutual Interests of Foresters and Engineers, Joseph Kittredge, Jr. (To Tech Engineering News.)

The Last Stand of Michigan's Primeval Forest. A. E. Wackerman. (To Detroit News, American Lumberman.)

Use of Statistical Methods in Forest Research. J. Kittredge, Jr. (Journal of Forestry.)

Northeastern

Forest Research in the Northeast. S. T. Dana. (To Maine Forester.)

District 4

Climate, Soil, and Native Vegetation of Brushlands as Indicators of Planting Sites for Western Yellow Pine. F. S. Baker and C. F. Korstian. (To authors for revision.)

Priest River

Some Factors Affecting Reproduction After Logging in Northern Idaho. J. A. Larsen. (Board of Review.)

Southwestern

Growing Season of Western Yellow Pine. G. A. Pearson. (Journal of Forestry.)

Increment of Cut-over Stands of Western Yellow Pine in Arizona. Herman Krauch. (Bulletin: Revision to Editor.)

In Print

Comments on Investigations of Tapers as a Factor in the Measurement of Standing Timber. F. S. Baker (D-4). Journal of Forestry, January, 1924.

Forest Entomological Problems in the Lake States. S. A. Graham (Entomology - Lake States.) Journal of Forestry, January, 1924.

Lake States Forest Experiment Station and Its Field. R. Zon. (Lake States.) Lumber World Review, November 10, 1923.

Proposals for Western Pine Regions. R. H. Weidman (Priest River.) Lumber World Review, December 25, 1923.

Lake States Forest Station. R. Zon. (Lake States.) Paper, November 15, 1923.

Practicable Steps in the Douglas Fir Region. T. T. Munger (D-6.) Lumber World Review, December 25, 1923.

Federal Proposals in the Sierras. S. B. Show (District 5.) Lumber World Review, December 25, 1923.

Relation of Weather Forecasts to the Prediction of Dangerous Forest Fire Conditions. R. H. Weidman (Priest River.) Monthly Weather Review, November, 1923; 563-564.

Lightning and Forest Fires in California. S. B. Show (D-5). Monthly Weather Review, November 1923; 566-567.

How Weather Forecasting Can Aid in Forest Fire Control. Howard B. Flint. (D-1.) Monthly Weather Review, November, 1923; 567-569.

Meteorological Factors and Forest Fires. J. W. Hofmann (Wind River). Monthly Weather Review, November, 1923; 569.

Evaporation as a Simple Index to Weather Conditions, Carlos G. Bates (Fremont.) Monthly Weather Review, 1923; 570-571.

Atmospheric Humidity and Forest Fires. J. V. Hofmann (Wind River.) Lumber World Review, December 25, 1923.

It Takes Longer to Grow White Pine but Farmers Find It a Profitable Crop, Figures Indicate. Joseph Kittredge, Jr. (Lake States.) Detroit News, February 24, 1924.

The Lake States Forest Experiment Station and the Mining Industry. J. A. Mitchell (Lake States). Iron Ore (Ishpeming, Mich.), January, 19, 1924.

The need of an organization for the collection of forest statistics. R. Zon (Lake States). Cornell Forester, 1923, pp. 11-13.

Biotic Factor in Forestry, E. N. Munns (WO). Scientific Monthly, March, 1924.

A Mighty Elm Grown in a Michigan Forest. A. E. Wackerman (Lake States.) Detroit News, March 15.